

In the matter of

State of Oklahoma, ex rel., A. Drew Edmondson in his capacity as Attorney General of the State of Oklahoma, and Oklahoma Secretary of the Environment, C. MILES TOLBERT, in his capacity as the Trustee for Natural Resources for the State of Oklahoma, Plaintiffs

v.

Tyson Foods, Tyson Poultry, Tyson Chicken, Inc., Cobb-Vantress, Inc., Aviagen, Inc., Cal-Maine Foods, Cal-Maine Farms, Inc. Cargill, Inc., Cargill Turkey Products, LLC, George's, Inc., George's Farms, Inc., Peterson Farms, Inc., Simmons Foods, Inc. and Willowbrook Foods, Inc., Defendants.

CASE NO. 05-CV-329- GFK-SAJ

**in the United States District Court
for the Northern District of Oklahoma**

Expert Report

of

**J. Berton Fisher, Ph.D., CPG, RPG (TX #0201; MS#0301)
Lithochimeia, Inc.
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May 15, 2008**

production, from hatchery to the retail sales of broilers).¹³

Willow Brook Foods: Willow Brook Foods came into being in 1998 as the consequence of a merger between Hudson Foods and Tyson Foods, and the desire of Tyson to focus on its chicken business. Willow Brook's turkey operation, which began in 1920, had been sold to Hudson Foods in 1979.¹⁴ In early 2008, Willow Brook Foods employed more than 1,000 people in southwest Missouri and northern Arkansas. These operations included a feed mill, a turkey harvesting facility and a processing facility for turkey, pork, beef and chicken. In late March 2008, a unit of Cargill, Cargill Value Added Meats, announced that it had acquired certain assets of Willow Brook Foods including Willow Brook's operations in Springfield, Missouri where the original poultry plant was built in 1927.¹⁵ Willow Brook's agricultural operations, including the contract turkey production continue to operate.¹⁶

Cargill: Cargill and/or its affiliated companies began operating in Arkansas in the early 1960s. A Cargill document listing barn area by the year the barns were built (dated October 11, 2004) shows that at least one barn still used in the turkey growing operation was built in 1960, and that 23.25% of Cargill's listed turkey barn capacity at that time was built 25 or more years previously (before 1980).¹⁷ In 2007, Cargill and/or its affiliates employed approximately 2,000 people in Arkansas. Cargill and/or its affiliates have operations located in the Arkansas Communities of Booneville, Glenwood, Gentry, London,

¹² <http://www.tyson.com/Corporate/AboutTyson/History/1950s.aspx>

¹³ Poultry in the Arkansas Encyclopedia of History and Culture, <http://encyclopediaofarkansas.net/encyclopedia/entry-detail.aspx?entryID=2102>; Strausberg, S. F. 1995. From Hills and Hollers: Rise of the Poultry Industry in Arkansas. Fayetteville: Arkansas Agricultural Experiment Station.

¹⁴ Springfield News Leader, April 1, 2008. Willow Brook Foods sold; 780 local jobs to be lost available at <http://www.news-leader.com/apps/pbcs.dll/article?AID=/20080401/NEWS01/804010374>; <http://www.willowbrookfoods.com/corporate/corp.htm>.

¹⁵ O'Keefe, T., April 24, 2007. Willow Brook Foods Precision Slicing Underground available at <http://www.wattpoultry.com/PrintPage.aspx?id=12032>.

¹⁶ Press Release March 31, 2008: "Cargill acquires Willow Brook Foods"; available at http://www.cargillmeatsolutions.com/press_releases/2008/tk_cms_pr_willbrook.htm#TopOfPage.

¹⁷ CARTP158579.

Ozark, Russellville and Springdale.¹⁸ Cargill entered the turkey business in 1967, and the headquarters of Cargill Turkey Products business unit are located in Springdale, Arkansas.¹⁹ Between 1974 and 1975, Cargill purchased the turkey operations of Ralston Purina located in Springdale, Arkansas, and California, Missouri.²⁰ The "Springdale Complex" comprises Cargill Turkey Products operations in Springdale, Gentry and Ozark, Arkansas, employs approximately 1,000 people and was established in 1964.²¹ Cargill sold Sunny Fresh Foods with operations within the Illinois River Watershed to Cal-Maine between about 1989 and 1990.²²

The operations at Springdale and Gentry, Arkansas formerly operated by Cargill and now operated by Cargill Turkey Products are located within the Illinois River Watershed.²³ The Springdale, Arkansas operations include a feed mill, and the Gentry, Arkansas operations include a hatchery. Cargill turkey operations within the Illinois River Watershed include six company-owned breeder farms, pre-production farms and production farms.²⁴

18 Affidavit of Steven Willardsen in support of the Cargill Defendants' response to Plaintiffs' motion to compel, Document 1136, Case 4:05-cv-00329-GKF-SAJ, Filed in USDC ND/OK on 04/26/2007.

19 Affidavit of Steven Willardsen in support of the Cargill Defendants' response to Plaintiffs' motion to compel, Document 1136, Case 4:05-cv-00329-GKF-SAJ, Filed in USDC ND/OK on 04/26/2007.

20 http://www.cargill.com/about/history/history_1950.htm; CARTP114667.

21 Affidavit of Steven Willardsen in support of the Cargill Defendants' response to Plaintiffs' motion to compel, Document 1136, Case 4:05-cv-00329-GKF-SAJ, Filed in USDC ND/OK on 04/26/2007.

22 Videotaped 30(B)(6) Deposition of Cal-Maine Foods (Steve Storm), October 8, 2007, page 36 line 19-25; page 37 line 1-3; Videotaped 30(B)(6) Deposition of Cal-Maine Foods (Steve Storm), October 9, 2007, page 233 line 2-21.

23 Affidavit of Steven Willardsen in support of the Cargill Defendants' response to Plaintiffs' motion to compel, Document 1136, Case 4:05-cv-00329-GKF-SAJ, Filed in USDC ND/OK on 04/26/2007.

24 CARTP158224-158226; ACA0007, BCA000149, BCA000150, BCA000152, BCA000153, BCA000154, BCA00082, CARTP000003, CARTP000004, CARTP000773, CARTP000836, CARTP000915, CARTP000977, CARTP000989, CARTP000997, CARTP001062, CARTP001070, CARTP001118, CARTP001218, CARTP001275, CARTP001377, CARTP001383, CARTP001484, CARTP001542, CARTP001610, CARTP001655, CARTP001723, CARTP001784, CARTP001879, CARTP001953, CARTP001993, CARTP002065, CARTP002085, CARTP002177, CARTP002262, CARTP002304, CARTP002312, CARTP002366, CARTP002431, CARTP002508, CARTP002676, CARTP002785, CARTP002835, CARTP002838, CARTP002881, CARTP002886, CARTP002962, CARTP003043, CARTP003060, CARTP003228, CARTP003365, CARTP003532, CARTP003561, CARTP003578, CARTP003762, CARTP003907, CARTP004091, CARTP004242, CARTP004386, CARTP004403, CARTP004529, CARTP004692, CARTP004854, CARTP005036, CARTP005239, CARTP005402, CARTP005537, CARTP005729, CARTP005857, CARTP006005, CARTP006008, CARTP006061, CARTP006208, CARTP006210, CARTP006456, CARTP006486, CARTP006521, CARTP006684, CARTP006858, CARTP007038, CARTP007212, CARTP007331, CARTP007447, CARTP007457, CARTP007568, CARTP007576, CARTP007721, CARTP007724, CARTP007887, CARTP011058,

Cobb-Vantress: In 1961, Cobb-Vantress opened a hatchery in Siloam Springs, Arkansas, which became Cobb's international headquarters in the late 1980s. In 1994, Tyson Foods, Inc. acquired 100% of Cobb's stock from the Upjohn Company.²⁵

Peterson Farms: In 1939, Lloyd Peterson began the Peterson Produce and Hatchery Company. In 1947, the company changed its name to Peterson Industries. By 1952, the company had an incubator capacity of 356,000 and was hatching 75,000 chicks each week. Additionally, the company had a breeding farm with a capacity of 44,000 birds and an experimental farm with a capacity of 25,000 birds. The company's feed mill could produce 80 tons/8-hour shift. Peterson Farms began broiler processing in 1963. In 1966 Peterson Industries formed Decatur Foods, a processing and marketing company that at that time processed 250,000 birds per week.²⁶

Simmons: Simmons' history in the Illinois River Watershed area begins in 1949 when M. H. "Bill" Simmons and a partner, Frank Pluss, purchased a converted motel to form Pluss

CARTP082823, CARTP082849, CARTP082863, CARTP082877, CARTP082904, CARTP082917, CARTP082930, CARTP082947, CARTP082964, CARTP082981, CARTP082998, CARTP083015, CARTP083032, CARTP083049, CARTP083066, CARTP083083, CARTP083100, CARTP083117, CARTP083134, CARTP083151, CARTP088204, CARTP088271, CARTP088319, CARTP088449, CARTP088507, CARTP091380, CARTP091489, CARTP091591, CARTP091654, CARTP091737, CARTP091828, CARTP091855, CARTP091942, CARTP092020, CARTP092111, CARTP092173, CARTP092253, CARTP092382, CARTP092528, CARTP092602, CARTP092703, CARTP092788, CARTP092980, CARTP093059, CARTP093150, CARTP093199, CARTP093289, CARTP093428, CARTP093516, CARTP093603, CCA00016, CCA00017, CM000000354, CM000000427, CM000000430, CM000000444, CM000000699, CM000000703, CM000000848, CM000001044, CM000001058, CM000001294, CM000001372, CM000001378, DCA00026, OKDA01107, OKDA02994, OKDA06302, OKDA10055, OKDA1124, OKDA15917, OKDA16237, OKDA17587, (note OKDA prefix records are also within PI-Fisher00027498-00031831)OK-PL-0000004, OK-PL-0000251, OK-PL-0000632, OK-PL-0001109, OK-PL-0001506, OK-PL-0001875 thru OK-PL-0001924, OK-PL-0002541 thru OK-PL-0002591, OK-PL-0002592 thru OK-PL-0002642, OK-PL-0002696 thru OK-PL-0002747, OK-PL-0002850 thru OK-PL-0002900, OK-PL-0002870, OK-PL-0002952 thru OK-PL-0003003, OK-PL-0003004 thru OK-PL-0003054, OK-PL-0003055 thru OK-PL-0003105, OK-PL-0003712, OK-PL-0003823, OK-PL-0003835, OK-PL-0003854, OK-PL-0003862, PFIRWP-000186, WCA000192, WCA000193, WCA000195, WCA000196, WCA000198, WCA000199, ODAFF Database ID 1032, ID 260, ID 294, ID 432, ID 532, ID 727, ID 732, ID 789.

²⁵ <http://www.cobb-vantress.com/AboutUs/CobbHistory.aspx>.

²⁶ This discussion is drawn from Crisp, H. 1989. Lloyd Peterson and Peterson Industries, An American Story. August House, Little Rock; <http://www.petersonfarms.com>.

waste, edge of field runoff from fields upon which poultry waste has been disposed, surface waters and some ground water samples within the Illinois River Watershed⁴⁹ Dr. Roger Olsen, using a pathway sampling approach combine with a principal component analysis (PCA), has shown that fecal bacteria from poultry waste are transported from poultry waste disposal sites to waterways and ground water within the Illinois River Watershed.⁵⁰ Dr. Christopher Teaf has evaluated the amount of fecal bacteria contributed to the Illinois River Watershed. He has determined that 41.1 % is contributed from poultry waste, 44.4% percent is contributed by cattle, 13% is contributed by swine, 0.9% is contributed by failing septic tanks and 0.01% is contributed by WWTP effluents.⁵¹

6. The population of poultry within the Illinois River Watershed has shown an overall increase since at least 1950. Based on Defendants documents⁵², a total of at least 1.1 billion birds of all types⁵³ have been produced by Defendants within the Illinois River Watershed during the period 2000 through 2007. The total number of birds produced within the Illinois River Watershed by Defendants is shown in Table 1 below.

⁴⁹ Expert Report of Bernie Engle, 2008.

⁵⁰ Expert Report of Roger Olsen, 2008.

⁵¹ Expert Report of Christopher Teaf, 2008.

⁵² Defendants' information concerning recent poultry production within the Illinois River Watershed (Cal-Maine Exhibits 46 47.pdf; Cargill Inc 2nd supp answer.pdf; Cargill Turkey 2nd supp answer.pdf; CARTP177361.pdf; CART177359.pdf; cover.pdf; DOC20080107140732.pdf; DOC20080107140753.pdf; DOC20080107140816.pdf; DOC20080107140838.pdf; Georges.mdb; IRW Breeders -- Created by Court Order-Not Kept in Ordinary Course of Business.xls; IRW Broilers -- Created by Court Order - Not Kept in Ordinary Course of Business.xls; Peterson 2nd Supp Response to First Interr and RFP.pdf; SIMAG32198- number Birds and feed.pdf; Total Bird Counts.xls).

⁵³ The total is 1,130,938,719 birds of all types.

Table 9. Tons of Poultry Waste Hauled from the Illinois River Watershed to Locations Outside the Illinois River Watershed by BMPs, Inc. and George's (2003-2006)					
Year	2003	2004	2005	2006	TOTAL
BMPs, Inc. Tons	0.00	905.88	14,783.57	59,736.56	75,426.01
George's Tons	8,877.60	11,406.30	19,651.13	9,282.45	49,217.48
TOTAL Tons	8,877.60	12,312.18	34,434.7	69,019.01	1,246,43.50
% of Poultry Waste Produced that was Hauled	2.51%	3.48%	9.73%	19.50%	8.80%

15. Defendants' feed formulas show that Defendants add chemical compounds, including compounds containing phosphorous, and metals (sodium, potassium, calcium, copper, zinc, arsenic and selenium). Poultry diets contain numerous chemical elements, including phosphorous, copper and zinc and arsenic.⁸⁹ Moreover, standard reference diets for chicks are specifically formulated using chemical compounds containing phosphorous, copper and zinc.⁹⁰

The feed formulations⁹¹ used by Tyson, Simmons, Peterson, Cargill, George's and Cal-Maine demonstrate that the Defendant's design and control the composition of feed provided to their poultry. In general, the feed formulations specified by the Defendants are dominantly comprised of corn and soybean meal, but frequently contain appreciable quantities of other grains and/or grain processing wastes as well as poultry by-product meal,⁹² feather meal, meat and bone meal, animal fat (including poultry fat), and various organic nutrients, including vitamins and amino acids. In nearly all cases, Defendants' feed formulations specify the addition of numerous chemicals (other than the materials specified in the foregoing list). The chemical compounds added to feeds by Tyson, Simmons,

89 See Chapters 1, 2 and 3, National Research Council. 1994. Nutrient Requirements of Poultry 9th Revised Edition, National Academy Press, 155 pp.

90 See Chapter 10, Standard Reference Diets for Chicks, National Research Council. 1994. Nutrient Requirements of Poultry 9th Revised Edition, National Academy Press, 155 pp.

91 CM003472 - CM003581; CARTP007982 - CARTP010833; GE 34777 - GE 35008; GE 35127 - GE 35138; GE 36091 - GE 36458; PFIRWP-063697 - PFIRWP-064049; SIM AG 31786- SIM AG 32150; TSN0001NCFF - TSN0570NCFF; TSN0001SCFF - TSN0535SCFF.

92 Poultry byproduct meal is made by grinding the rendered parts of poultry carcasses (see http://en.wikipedia.org/wiki/Chicken_by-product_meal).